December 12, 2019

Mr. Douglas Luetjen
BSRE Point Wells, LP
c/o Karr Tuttle Campbell
701 Fifth Avenue, Suite 3300
Seattle, Washington 98177

**Re: Landslide Area Deviation Request Based on Preliminary Analysis**
**Point Wells Redevelopment**
**Unincorporated Snohomish County, Washington**
17203-57

Dear Mr. Luetjen:

We have revised this letter to address items in Snohomish County's May 9, 2018 memorandum (from Randolph Sleight) that commented on our original April 24, 2018 landslide deviation request letter and items in the June 1, 2018 County Findings of Fact/Conclusions of Law document for the hearing examiner. In this letter, we clarify project information supporting the request for a deviation for development in a landslide area at the Point Wells Redevelopment (Project) in unincorporated Snohomish County, Washington (County). Our June 22, 2018 Subsurface Conditions Report Addendum provides much of the information and clarifications referenced in this letter and is intended to accompany this letter.

In this letter, we discuss requirements of the Snohomish County Code for landslide hazard areas (SCC 30.62B.320 and 30.62B.340, 2007 version in effect when the project vested in 2011) and show how these requirements have been met. This letter requests two separate deviations for developing the proposed a) Secondary Access Road and b) buildings (including the Sounder Station) in the Urban Plaza in a landslide hazard area after satisfying the SCC 30.62.320 and 30.62.340 requirements.

The intent of this letter is to demonstrate that these deviation requests are feasible/approvable by the County once the final design is completed. The final design would follow the general approach suggested by our current preliminary analysis. This agrees with the County's May 9, 2018 Supplemental Staff Recommendation statement (third paragraph on page 22), "It is appropriate for an applicant to provide specific details regarding the design of structures at a later stage, such as the time of building permit review. However, at this stage in the permitting process, the applicant must demonstrate the *feasibility* of the structures." If these deviation requests are not approvable at the building permit stage using the stated geotechnical approaches, we request the opportunity to discuss with Mr. Sleight what specific additional items would be needed to receive approval.

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**Exhibit V-15 Landslide Deviation Request dated Dec 12 2019**
**PFN: 11-101457 LU**

# Project Background

The proposed project will be a mixed-use (i.e., residential, retail, commercial, and public recreation) urban center development with multiple low- to high-rise buildings, supporting infrastructure, an open space, and a secondary access road. Additional project information is being provided in the December 2019 submittal to Snohomish County Planning and Development Services (PDS).

# Landslide Area Regulations

## Items Satisfying Landslide Hazard Area Requirements

The following items list SCC 30.62B landslide hazard area requirements and reference specific December 2019 protect submittal documents and our December 12, 2019 geotechnical addendum letter (Hart Crowser 2019) to our geotechnical report (Hart Crowser 2018a) that satisfy these requirements. Items are organized using SCC 30.62B numbering.

### *SCC 30.62B.140 Geotechnical Report Requirements*

- (1) and (2) are satisfied by Sections 3 to 6 and Figures 2 to 12 in the April 20, 2018 geotechnical report (Hart Crowser 2018a) with the following exceptions:
  - (2)(c) is not applicable since the site is not near one of the listed channel migration zones.
  - (2)(d) impervious surfaces, wells, and drain facilities, etc. are provided in the existing survey plans (EX1 and EX2), summarized on Figure 3 of the geotechnical report, and Figure 3 of the hydrogeologic report (Hart Crowser 2018c).
  - (2)(h) proposed development is described in detail on the December 2019 project plans (Perkins + Will 2019).
  - (2)(j) drainage methods are shown in general on Figure 2a and discussed in the geotechnical letter addendum (Hart Crowser 2019), discussed in Section 7.1.1 of the geotechnical report (Hart Crowser 2018a), generically indicated on the civil drainage plans (C-300 series, Perkins + Will 2019), and discussed in the drainage reports (MIG|SvR 2019a and 2019b).
  - (2)(k and l) existing vegetation, vegetation management, and vegetation mitigation/restoration plans are included in the critical areas report (especially Critical Areas Report [CAR] Section 9, David Evans & Associates 2019) and discussed in Sections 5.1.5 and 7.1.1 of the geotechnical report (Hart Crowser 2018a).
  - (2)(m) upland erosion is discussed in Sections 6.4 and 7.1.4 of the geotechnical report (Hart Crowser 2018a). Coastal erosion, due to wind and wave action, as well as shoreline stabilization methods, are discussed in the coastal engineering report (Moffat & Nichol 2018).

### *SCC 30.62B.320 General Standards and Requirements for Landslide Hazard Areas*

- (1)(a)(i) geotechnical reporting is satisfied, as noted in the prior section.

- (1)(a)(ii) would be satisfied by using best management practices (BMPs) and all known and available reasonable technology (AKART) of 30.63A SCC, as determined appropriate by PDS for final design. At this preliminary stage of the project, preliminary BMPs are shown on the Civil temporary erosion and sedimentation control plans (C-200 series plans, Perkins + Will 2019), discussed in the drainage reports (MIG|SvR 2019a and 2019b), and discussed in Sections 6.4, 7.1.4, and 7.2 of the geotechnical report (Hart Crowser 2018a).

- (1)(a)(iii) collection, concentration, or discharge of stormwater or groundwater within the landslide hazard area will be addressed by methods noted in the response above to SCC 30.62B.140(2)(j). This will improve slope stability from current wet slope conditions by controlling surface water and groundwater.

- (1)(a)(iv) secondary access road will increase impervious surfaces on the slope some, but the added drainage improvements for the road would be designed to control surface and groundwater, which will improve slope stability from current wet slope conditions. Removal of vegetation for the secondary access road would be minimized to the extent practicable. Minimizing removal of vegetation and improving slope vegetation as recommended in Section 7.1.1 of the geotechnical report (Hart Crowser 2018a) would help reduce surface water infiltration, erosion, and shallow sloughing. Mitigation and restoration plans in the CAR (especially Section 9, David Evans & Associates 2019) should improve the habitat function for the project overall.

- (1)(b)(i) the risk of property damage, death, or injury from potential landslides will decrease from current conditions by slope stabilization retaining walls designed to resist landslide static and seismic forces, as noted in Sections 5.1.6.1, 6.1, and 7.1.1 of the geotechnical report (Hart Crowser 2018a) and Table 3a of our 2019 report addendum (Hart Crowser 2019). Additional measures that can be included during final design to provide additional protection include: a) two walls on either side of the secondary access road (i.e., Figures 24 and 25 of the 2018 geotechnical report), b) increasing the height of retaining walls to extend above grade and designing them to withstand slide runout from shallow slides starting higher up slope, c) adding a retaining wall on the up-slope side of the secondary access road (Screen Wall added to Plan Sheet C-300) to contain slide runout, and/or d) designing the east side of buildings to have walls to withstand/retain slide runout for some height above final grades (e.g., reinforced concrete without windows or doors).

- (1)(b)(ii) erosion hazard would be controlled by BMPs and AKART methods, as noted in (1)(a)(ii) above.

- (1)(b)(iii) surface water discharge would be controlled and improved from current conditions on the east slope near the secondary access road and conveyed to the base of the slope to existing conveyance pipes, which will reduce slope instability and sedimentation, as discussed in (1)(a)(ii) and (1)(a)(iv) above.

- (1)(b)(iv) impacts to wetlands, fish, and wildlife habitat conservation areas are discussed in Section 9 of the CAR (David Evans & Associates 2019).

- (2) shoreline stabilization measures are discussed in the coastal engineering report (Moffat & Nichol 2018) and setbacks and protection of wetlands and habitat conservation measures are discussed in Sections 3, 8, and 9 of the CAR (David Evans & Associates 2019).
  - (2)(a) the existing shoreline bulkhead will be removed, riprap will be removed, the shoreline slope flattened (effectively setting it back), and the shoreline restored to natural habitat conditions (see CAR Section 9, David Evans & Associates 2019). Thus, existing shoreline stabilization will be replaced using flatter slopes and natural coarse gravel instead of structural stabilization measures (Moffat & Nichol 2018).
  - (2)(b) landslide stabilization measures consisting of a retaining wall for the secondary access road are necessary to stabilize the slope to achieve adequate factors of safety per SCC 30.62B.340(3)(b), as discussed in the next section. The retaining wall east of the Upper Plaza would also protect the public roads and bridge over the railroad to the west part of the site.

## *SCC 30.62B.340 Landslide Hazard Area*

### Secondary Access Road

- **(2) Alternate Locations Considered.** Construction of the secondary access road is required by PDS. We understand its location is required to be different than the existing site southern access via Richmond Beach Drive, which leaves access routes to the northeast and southeast as possible options. Plan Sheet C-300 (Perkins + Will 2019) and our August 2016 report (Hart Crowser 2016) shows access routes considered (Appendix E) to the northeast (Abandoned Access Road) and southwest (current Secondary Access Road). Both locations are located in landslide hazard areas. The northeastern option required more grading in wet areas and the Abandoned Access Road was displaced in places, suggesting less stable conditions (Figure 5 Hart Crowser 2018a). The current southeast Secondary Access Road location shown on Plan A-051 and in the geotechnical report (Figures 5 and 10, Hart Crowser 2018a) encounters fewer geologic critical areas, especially landslide hazard areas than the northeast location. The southeast location is also in an area that has flatter average slopes (Figure 4, Sections E, F, and G, Hart Crowser 2018a). Thus, the southeastern access route option is more suitable than the northeast route. However, final design will need to follow final geotechnical design recommendations for subgrade preparation, drainage, and stabilization measures.

- **(2) Geotechnical Report Demonstrates Code Required Protection is Provided.** The proposed retaining wall for the secondary access road would improve slope stability above current conditions to satisfy the required factors of safety in SCC 30.62B.340(3)(b), as discussed in Sections 5.1.6.1 and 7.1.1 of the geotechnical report (Hart Crowser 2018a). The geotechnical addendum letter (Hart

Crowser 2019) clarifies how the stability analysis for the retaining wall demonstrates it is feasible to achieve the required factors of safety in SCC 30.62B.340(3)(b). Key points are summarized below.

- The retained height of the retaining wall (Figures 22, 22a, 23, and 23a; 'a' designates updated figures in the addendum letter) permanently supports about 40 feet above final grades. The lower 20 feet below grade would temporarily support building basement wall lateral earth pressures until building basement floor slabs and walls are complete. Once complete, building walls and slabs would transfer lateral earth loads on the east side of the basement to soil on the opposite, or west, side of the building. The number of rows of tiebacks can be designed to be adjustable to include the lower 20 feet of wall at different times to accommodate different building phasing scenarios.

- Geotechnical slope stability analysis/calculation results Figures 22 to 23 (including 22a and 23a) show how a generic retaining wall providing 82,000 pounds per foot of wall of resisting force achieves the required County factors of safety. Several retaining wall options could be used. Figures 22a and 23a of our addendum letter demonstrate how a permanent soldier pile and tieback retaining wall system is feasible to provide these loads (including soldier pile and tieback geometry and loads).

    - Section 5.1.6.1 of our report (page 23) discusses how a high strength (i.e., cohesion of 10,000 pounds per square foot [psf]) was used in the stability analysis (results in Figures 18 - 25) to represent the retaining wall (typically steel and concrete) that would be designed to be structurally strong enough so slip surfaces do not go through it.

    - A high cohesion (10,000 psf) was not used for soil, as noted above.

- Figures 22a and 23a include excavation west of the railroad to elevation +6 feet, showing factors of safety above the required values. See our December 2019 addendum letter for a more detailed discussion.

- Perched groundwater was encountered in the five vibrating wire (VW) piezometers installed in three borings for the secondary access road, as noted in Table 2 of our 2018 report (Hart Crowser 2018a) and Table 2a of our 2019 report addendum letter (Hart Crowser 2019). As noted in Section 5.1.6.1 (Section G-G' subsection, pages 22 to 23), perched groundwater was encountered at different elevations in the VW piezometers. However, stability analysis used a conservative groundwater assumption that all soil below the highest perched groundwater elevation is saturated. Based on this conservative groundwater assumption, stability analysis shows that groundwater drainage control was not required upslope of the road to achieve the required factors of safety for the Secondary Access Road.

- Landslide runout does not appear to be a requirement in SCC 30.62B, nor is there a well-accepted standard of practice for how it is used and applied in conjunction with slope stability analysis. In our opinion, the existing landslide runout methods are suitable to be used as estimates, but should be used with caution for design purposes. Site slopes range from about 40 percent near Section B to 20 percent near Section G, which are much less than the estimated Woodway pre-slide slopes (70 percent). Thus, in our opinion, a Woodway type slide runout is highly unlikely east of this project. Estimated runout distances, from the references we found, for the 50th to 90th percentile slides studied were between about 200 to 300 feet, respectively, from the headscarp of landslides. If these rough estimated runout distances start from the headscarp of slip surfaces estimated in our slope stability analysis, the runout should not reach the base of the slope near the secondary access road and Upper Plaza buildings. Slopes at Section G are very flat, so are likely closer to the lower end of the runout distances in the studies we reviewed. The small, shallow critical (lowest factor of safety) slides on Figure 23a of our 2019 addendum letter indicate that large runout from large deep-seated landslides are likely above the Upper Plaza.

- (2)(b)(ii)(A) indicates that alternate setbacks must provide protection that is equal to standard setbacks. Standard setbacks keep structures away from unstable slope conditions, but do not increase or improve slope stability (i.e., do not change the hazard). The proposed retaining wall would provide equivalent protection to the standard setbacks by designing the wall to provide the resisting force noted above to increase slope stability to code required factors of safety. Thus, an appropriately designed and constructed retaining wall would reduce the slope instability hazard.

- The geotechnical report and addendum letter meet the requirements of SCC 30.62B.320, as discussed in the prior section.

- (3)(a) vegetation removal would be minimized, as discussed in SCC 30.62B.320(1)(a)(iv) and the vegetation management and restoration are discussed in the CAR (David Evans & Associates 2018).

- (3)(b) slope stability factors of safety are satisfied, as discussed in (2) [Geotechnical Report] above.

- (3)(c and d) different retaining wall and slope stabilization options (single wall and multiple stabilization tiers) are presented in the geotechnical report (Hart Crowser 2018a) that satisfy this and the prior item.

- (3)(e) utility lines would be constructed along the secondary access road according to these requirements, as the existing utilities in this sloped area are now.

- (3)(f) stormwater, surface water, and collected groundwater along the secondary access road would be collected and conveyed down slope to a suitable discharge point, as discussed in SCC 30.62B.140(2)(j) and SCC 30.62B.320(1)(a)(iii) above.

### *Urban Plaza Buildings (Including Sounder Station)*

This section is intended to be a separate deviation request, from the Secondary Access Road, for the buildings in the Urban Plaza. These proposed buildings are currently located within a landslide hazard area, which would be protected by a future retaining wall(s) and/or other slope stabilization methods.

**(2) Alternate Locations.** We understand from the project architect (Perkins+Will) that buildings in the Urban Plaza (including the Sounder Station) need to be located in the front part of the site because the multi-modal transportation center has to be located by the railroad, existing entry road, and proposed secondary access road, as well as other reasons. See Attachment 1 for specific building siting considerations.

**(2) Geotechnical Report Demonstrates Code Required Protection is Provided.** The same comments as noted above for the Secondary Access Road apply.

### *Other Items*

We understand the Secondary Access Road grading widths have recently been revised to stay within the property limits for the eastern narrow section of this road. We understand that short retaining walls would be used on one or both sides to achieve these requirements unless agreements are reached with adjacent property owners or the Town of Woodway during final design. In our opinion, this type of change should be geotechnically feasible and can be determined during a later design stage.

## Conclusions

In summary, our findings and recommendations are:

- The proposed development would not decrease and would actually increase slope stability and improve drainage conditions on the slope adjacent to the secondary access road and above the Urban Plaza. We are of the opinion that current slope stability analysis demonstrates feasible options to achieve the code-required slope stability factors of safety.

- Some items to completely satisfy SCC 30.62B would need to be completed during final design stages when final design plans are being completed. These items include, but are not limited to, final geotechnical design stability analysis, slope stabilization recommendations, permanent drainage recommendations, and building support recommendations.

- If the proposed development is designed, constructed, operated, and maintained in conformance with the appropriate construction practices, County regulations, and final design geotechnical recommendations by Hart Crowser and other design team members; slope stability, drainage, habitat protection, mitigation, and restoration are unlikely to be degraded by the proposed

development (many would be improved). County requirements for SCC 30.62B could be satisfied during the later design stages.

- Based on our review of the documents to be included in the December 2019 submittal to PDS, it is our professional engineering opinion that a deviation to allow development in the landslide hazard area that satisfies the requirements of SCC 30.62B.140, SCC 30.62B.320, and SCC 30.62B.340 could be granted by the County.

We trust this letter provides the required information. Please let us know if you or others have any questions about the content of this letter.

Sincerely,

**HART CROWSER, INC.**


**N. JOHN BINGHAM, PE**
Senior Associate, Geotechnical Engineer

Attachments:
Attachment 1 Landslide Hazard Areas Revision [SCC 30.62B.340 alternate location criteria] letter by Perkins+Will dated December 12, 2019

## References

David Evans and Associates, 2019. Critical Areas Report, BSRE Point Wells, LP, Redevelopment Project, December 2019.

Hart Crowser 2018a. Subsurface Conditions Report: Point Wells Redevelopment, April 20, 2018.

Hart Crowser 2018b. Point Wells Urban Center, Environmental Remediation Approach, Memorandum April 20, 2018.

Hart Crowser 2018c. Point Wells Redevelopment, Hydrogeologic Report, April 20, 2018.

Hart Crowser 2019. Subsurface Conditions Letter Addendum: Point Wells Redevelopment, December 12, 2019.

Hart Crowser 2016. Draft Final, Subsurface Conditions Report, Point Wells Redevelopment, Prepared for BSRE Point Wells, LP by Hart Crowser, August 4, 2016.

MIG|SvR 2019a. Point Wells Development, Preliminary Short Subdivision Submittal, Targeted Stormwater Site Plan Report, December 12, 2019.

MIG|SvR 2019b. Point Wells Development, Urban Center Submittal, Targeted Stormwater Site Plan Report, December 12, 2019.

Moffat & Nichol 2018. Coastal Engineering Assessment, Point Wells Redevelopment, June 2018.

Perkins + Will 2019. Point Wells Development, Urban Center Review Response, Combined [Plan] Set, December 12, 2019.

Snohomish County 2007. Snohomish County Code, Chapters 30.62A - Wetlands and Fish & Wildlife Habitat Conservation Areas and 30.62B Geologic Hazardous Areas.

Perkins&Will

12.12.2019

**Doug Luetjen**

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**Re: Point Wells, SCC 30.62B.340 Landslide hazard area deviation request**

Dear Mr. Luetjen,

Following is supporting information for a deviation request to requirements outlined in *former SCC 30.62B.340 Landslide hazard areas*.

The deviation request is for 4 buildings (UP-T1 and Retail Building - including below grade parking/bus loop - Service Building 1 and Service Building 2) on the Urban Plaza at the Point Wells project.

BSRE has reviewed alternate solutions from what is proposed here and found no alternative to locating some building component at this location. The reasons for this include code required setbacks, required minimum project density and project site ingress/egress paths.

**Code required buffers and setbacks**

The project site is constrained to the north by wetlands, steep slope buffers and residential zoning setbacks. To the west, the shoreline management buffers constrain development area. After addressing parking requirements, service drives, and fire lane access for every building the resulting buildable site area within the code required constraints is insufficient to meet the code required project density. To address this conflict BSRE proposes a two-pronged approach, a variance request for height greater than 90', and this deviation request for building area on the Urban Plaza. By utilizing both strategies, the residential density can be located further east on the site nearer the hillside and the buildings nearest the shoreline can be maintained at lower elevations – where buildings are most likely to impact views from neighboring sites.

**Project Density**

In order to meet the requirements of the Urban Center code for a 1.0 minimum FAR the Urban Plaza portion of the site includes more than 100,000 sf of building area.

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Point Wells, SCC 30.62B.340
Landslide hazard area deviation request

**Site Ingress/Egress Paths**

BSRE Point Wells has addressed secondary access requirements and coordinated with the county Fire Department to address primary site access and safety needs. The Urban Plaza area serves as a primary hub for vehicular and pedestrian access to and from the project site. Community service buildings are located on the east side of the tracks to limit the need for utility and service vehicle traffic on site roadways. The security and emergency facilities are located at the primary entrance to the site to provide visual access which enhances the safety and security of residents and visitors to the site.

The secondary access road has been revised to provide fire truck access to the north side of the Urban Plaza to improve fire service and provide a second egress point from this portion of the site for occupant safety.

**Dan Seng**
Associate Principal